

of each in every stage of development were anywhere from six inches to two feet distant. The rock was slightly shaded by sumachs, and the pocket, apparently a misplaced pot-hole, was about six inches in diameter, with a slit in one side. The soil in it looked like ordinary pasture loam, finely pulverized, but with no trace of leaf-mould or disintegrated limestone. It must, however, have had some virtue as three or four inches sufficed to support the two rarities, above described, and a young specimen of *Asplenium ebeneum*. The third plant of *A. ebenoides* grew in richer soil of considerable depth.

Unbelievers in the theory of the hybridity of *A. ebenoides* will find it difficult to gainsay the argument in its favor, which is spread on this grassy slope. The intermediate form of the fronds, their tendency occasionally to root at the tip, the abundance of both the supposed parent-stocks in the immediate neighborhood are matters here well illustrated. Furthermore, if an inability to reproduce from spores is any test of hybridity in a fern, additional testimony can be adduced from this source, for I have searched the section thoroughly and am convinced that not another plant of *A. ebenoides* is to be found in the locality. The presence of a single well-developed specimen with heavily fruited fronds in a perfect environment for the germination of spores must have some significance. The contention over the origin of this unique fern will probably cease only with artificial crossing of the species; this, however seems superfluous when such telling evidence can be obtained from the natural occurrence.

PITTSFORD MILLS, VERMONT.

SCIRPUS SUPINUS AND ITS NORTH AMERICAN ALLIES.

M. L. FERNALD.

ON September 7 Mr. E. F. Williams and the writer found on the sandy shores of Massapoag Lake, in Sharon, Massachusetts, a plant which superficially resembles *Scirpus debilis*, Pursh. The shining black achenes, however, are quite naked, even in their younger stages showing no trace of the perianth of retrorsely barbed bristles which quickly distinguishes *S. debilis* from the related *S. supinus* and *S. Smithii*. A study of the Massapoag plant in connection with the

available American and European material has brought out a number of interesting points in regard to the group of annual species of which *Scirpus supinus*, L., may be taken as the type. This small group of species is characterized by annual roots, rather slender essentially naked culms and few (rarely solitary) sessile spikelets much overtopped by the elongated involucre leaf. The species are superficially very similar, but in the achenes and their subtending scales they show certain very constant differences.

The presence or absence of a perianth of bristles, which has long been considered an important character, does not seem, however, a point sufficiently constant for specific diagnoses. Plants with otherwise identical characters, and differing only in the presence or absence of the bristles are well known in other genera of the *Cyperaceae*.

Among such cases are *Eleocharis Englemanni* and its var. *detonsa*, and *E. palustris*, and its var. *calva*; while in *Eleocharis monticola*, var. *leviseta*, and *Rhynchospora capillacea*, var. *leviseta*, the reduced bristles lack the barbellate character found in the otherwise undistinguishable species. It is not, then, very surprising to find that the extensive area of *Scirpus debilis* at Massapoag Lake quite lacks the characteristic perianth of the species, thus exhibiting a tendency parallel with that found in species of related genera.

The other species of the group are described as lacking the perianth, or in case of *Scirpus Smithii* as having "bristles 1 or 2 minute rudiments or none." A study of the material in the Gray Herbarium shows, however, two sheets of specimens collected by S. B. Mead in Illinois, in 1845, in which the spikelets and the achenes are undoubtedly of *S. Smithii*, but the bristles are as elongated and retrorsely barbed as in typical *S. debilis*. The European *S. supinus* ordinarily quite lacks a perianth, yet one specimen from Versailles distinctly shows rudimentary bristles, while similar rudiments are occasionally seen in its better known American representative, *S. Hallii*. In view of these facts it is apparent that we can no longer rely for final specific distinctions upon the presence or absence of bristles in this group; and that the characterizations of the species as now treated in our manuals must be considerably modified. Study of all the material at hand shows that in the achenes themselves we find characters of such constancy as to furnish a much safer basis for classification. The color of the achenes in all the species is very variable, but the shape and deeper markings supply the characters upon which is based the following synopsis.

SYNOPSIS OF SPECIES.

* Achenes transversely wrinkled; bristles normally absent.

+ Achenes distinctly triangular in cross-section.

S. SUPINUS, L. Plant 2.5 dm. or less high; the involucre leaf erect and very elongated, nearly or quite equalling the true culm: spikelets ovoid-lanceolate, acutish, 5 to 12 mm. long: the ovate or suborbicular ferruginous round-tipped scales short-mucronate: styles 3-cleft. — Spec. 49; Reichenb. Ic. Fl. Germ. viii. t. 302; Boeckeler, Linnaea, xxxvi. 699, in part; etc. — Continental Europe.

S. saximontanus. Very slender, 2 cm. to 3 dm. high, sparingly short-leafy at base; the erect involucre leaf one-half to one-fourth as long as the true culm: spikelets 1 to 4, oblong-cylindric, acute, 5 to 12 mm. long: scales ovate, cuspidate-acuminate, the margins pale brown: styles 3-cleft: achenes dark brown or black, 1.5 mm. long, one face slightly broader than the other two. — *S. supinus*, Gray, Man. Ed. 5, 563; Watson, Proc. Am. Acad. xviii. 171; Hemsl. Biol. Cent.-Am. Bot. iii. 462; not L. *S. Hallii*, Britton, Trans. N. Y. Acad. Sci. xi. 77, in part, not Gray. — COLORADO, banks of La Poudre River, Greeley, Sept. 20, 1872 (*E. L. Greene*): TEXAS, without locality (*Charles Wright*): Ciboto, June, 1847 (*F. Lindheimer*): SAN LUIS POTOSI, low ground, Penasco, 1876 (*J. G. Schaffner*, no. 571).

+ + Achenes plano-convex.

S. HALLII, Gray. Slender, 1 to 4 dm. high; the erect involucre leaf usually one-half to one-fourth as long as the true culm: umbel rarely branched, of 1 to 7 linear- or oblong-cylindric acute spikelets 0.5 to 1.5 cm. long: scales ovate, cuspidate-acuminate, the margins brownish: styles 2-cleft. — Man. ed. 3, addend. xcvi; Britton, l. c., in part, and in Britton and Brown, Ill. Fl. i. 264, fig. 615. *S. supinus*, var. *Hallii*, Gray, Man. ed. 5, 563. — MASSACHUSETTS, Winter Pond, Winchester, Aug., Sept. (*Hitchings, Boott, Faxon, et al.*): ILLINOIS, Menard Co., 1861 (*E. Hall*): FLORIDA, Indian River (*Curtiss*, no. 3118*): MISSOURI, St. Louis, Sept., 1845 (*Geo. Englemann*).

* * Achenes smooth or merely pitted.

+ Achenes unequally bi-convex or lenticular.

S. DEBILIS, Pursh. Comparatively stout, 6 dm. or less high; the erect or deflexed involucre leaf usually one-fourth to one-eighth as long as the true culm: spikelets 1 to 12, ovoid-oblong, bluntish, 0.5 to 1 cm. long: scales orbicular to broad-ovate, with tawny margins: achenes more or less pitted, broadly obovoid, contracted to a short

stipiform base; bristles 6, rather stout, retrorsely barbed, 2 or 3 surpassing the achene. — Fl. i. 55; Gray, Man. 527; Torr. Fl. N. Y. ii. 352, t. 139; Britton, Trans. N. Y. Acad. Sci. l. c., in part, and in Britton & Brown, l. c., fig. 616. *S. supinus*, β , Boeckeler, l. c. — Sandy or muddy shores from Industry, MAINE (*Fernald*) and Burlington, VERMONT (*Eggleston*) to MINNESOTA (*Hale*) and the Gulf of Mexico.

Var. **Williamsii**. Bristles entirely wanting: otherwise like the species. — MASSACHUSETTS, sandy shore of Massapoag Lake, Sharon, Sept. 7, 1901 (*E. F. Williams & M. L. Fernald*).

+ + Achenes plano-convex, one face distinctly flattened.

S. SMITHII, Gray. Slender, 0.5 to 4 dm. high; the erect involucre leaf usually one-half to one-third as long as the true culm: spikelets 1 to 5, ovoid-oblong, acutish, 0.5 to 1. cm. long: scales oblong-ovate, greenish or brown-tinged: achenes cuneate-obovoid, smooth or minutely pitted; bristles none or minute rudiments. — Man. ed 5, 563; Britton, Trans. N. Y. Acad. Sci. l. c., & in Britton & Brown, l. c. fig. 617. *C. debilis*, Britton, Trans. N. Y. Acad. Sci. l. c. as to Maine plant, not Pursh. — Shores, MAINE, Harrison, 1871 (*J. Blake*): VERMONT, Ferrisburg, Sept. 14, 1881 (*E. & C. E. Faxon*): RHODE ISLAND, Great Pond, South Kingston, Oct. 25, 1880, and Lake Wenden, Aug. 24, 1881 (*E. & C. E. Faxon*): NEW YORK, Sacketts Harbor, Lake Ontario, 1833 (*A. Gray*, Gram. & Cyp. no. 135); Sodus Bay, Lake Ontario, 1866 (*J. A. Paine*); Stirring Lake, 1878 (*H. L. Hoysradt*): NEW JERSEY, Delaware River, Red Bank, July, 1865 (*C. E. Smith*); Camden, Oct. 7, 1877 (*C. F. Parker*): PENNSYLVANIA, Schuylkill River, Penrose Ferry, Sept. 14, 1867 (*C. E. Smith*); Presque Isle, Sept. 4, 1868 (*T. C. Porter*): MICHIGAN, Pine Lake, Ingham Co., July 25, 1891 (*C. F. Wheeler*).

Var. **setosus**. Perianth of 4 or 5 slender retrorsely barbellate bristles mostly exceeding the achene. — ILLINOIS, Augusta, 1845 (*S. B. Mead*).

GRAY HERBARIUM.

SEVERAL UNCOMMON FERN-ALLIES FROM NORTHWESTERN MASSACHUSETTS — A few pteridophytes found in and about Williamstown in the summer of 1901, which appear to be rare in the state seem worthy of record.

Toward the end of May, while collecting mosses and hepatics about the base of Mt. Greylock, I was fortunate enough to find a number of minute specimens of *Botrychium simplex*, E. Hitchcock. They